



# Spacecraft Bus Requirements and System Engineering

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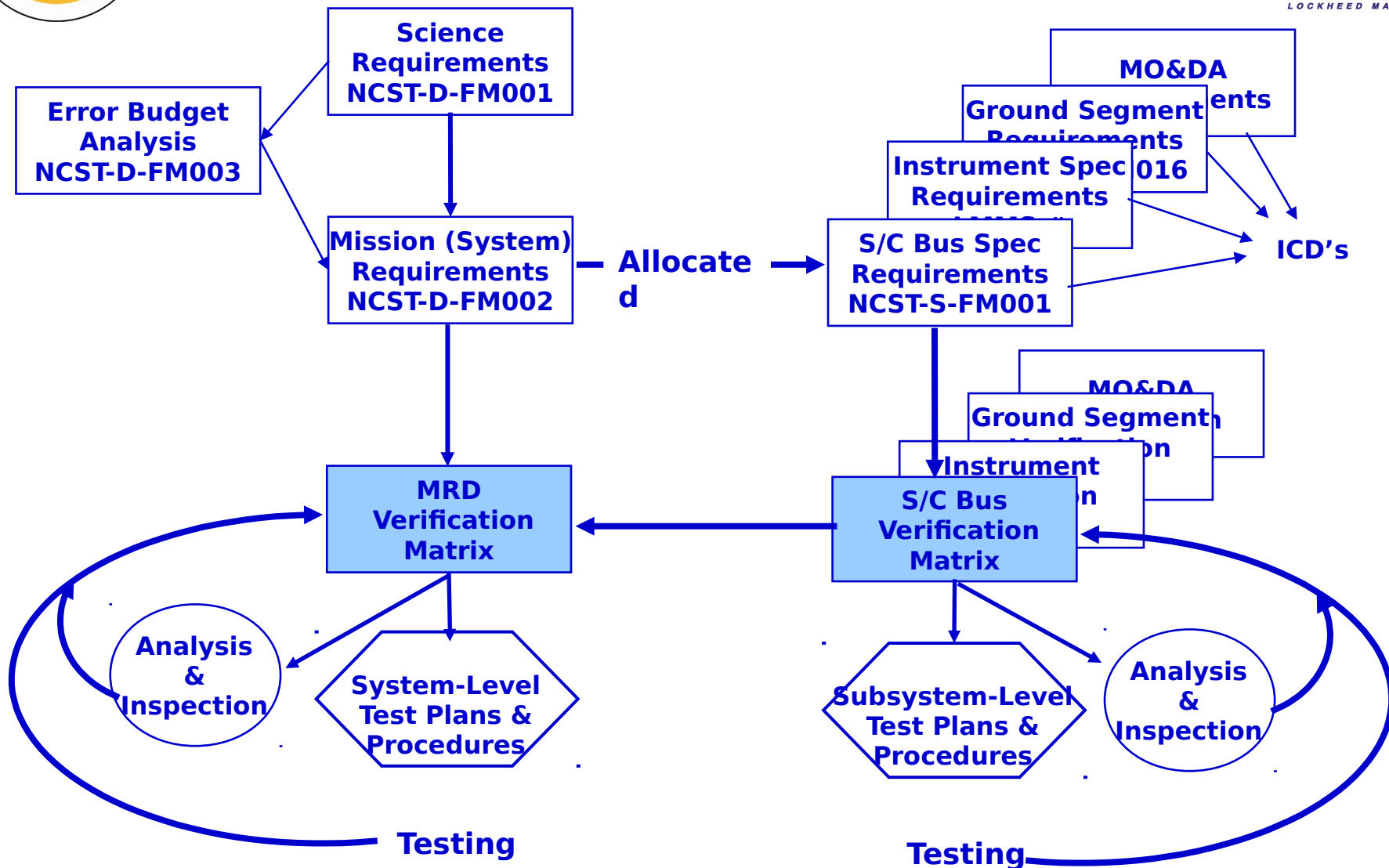
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# Requirements Allocation and Verification





# S/C Bus Verification Matrices



- **Goal Is to Assure That Observatory Hardware and Software Will Perform the Desired Mission**
- **to Achieve Goal:**
  - **Spacecraft Bus Design Specification NCST-S-FM001**
    - **Establishes Complete Set of Performance, Design, Interface and Safety Requirements**
  - **Verification Matrices**
    - **Establish Traceability From Requirement Documents to Design Implementation**
    - **Identifies Methods to Verify Each Requirement**
  - **Systems Engineering along With Individual Spacecraft Bus Subsystem Lead Are Responsible for Performing Verification and Documenting Evidence That Boxes/Subsystems Comply With Subsystem Requirement Document**



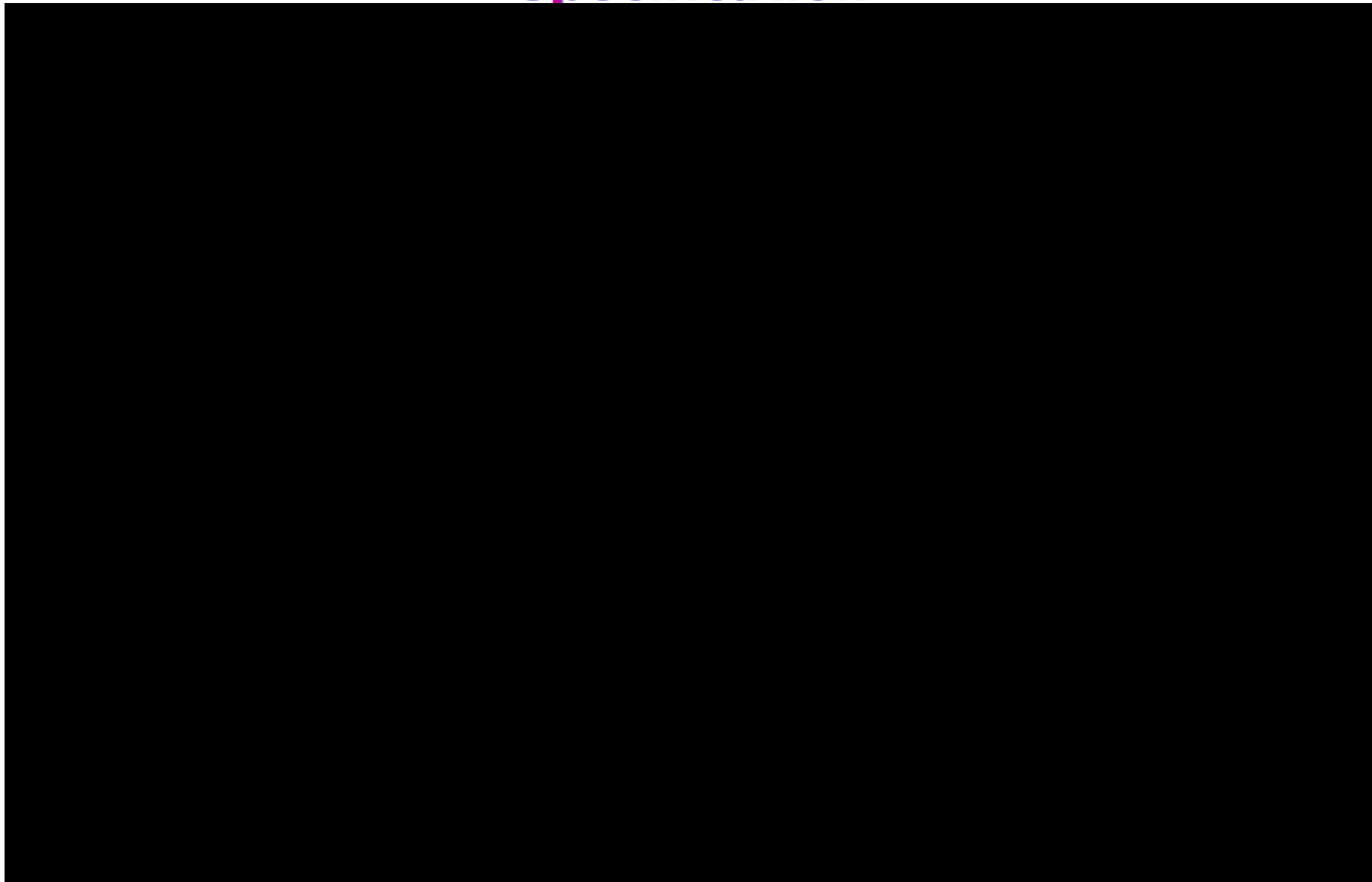
# Key Requirement Flowdown From MRD to S/C Bus Design Specification



Observing Parameters		
Spacecraft	Rotation Period	40 +/- 2 min
	Precession Period	20 +/- 2 days
	Sun Angle	35 +/- 5 deg
Astrometric Mission Requirements - Along Scan		
Rotation of Line of Sight (Modelable)	Solar Radiation Torques	Combine to 0.26 $\mu$ rad/sec in 300 sec
	Earthshine Torques	
	Solar Irradiance Variation	
Rotation of Line of Sight (Unmodelable)	Along Scan Jitter at 0.2 Hz	0.01 $\mu$ rad Peak to Peak
	Along Scan Jitter at 1.0 Hz	0.001 $\mu$ rad Peak to Peak
	Along Scan Jitter at 10 Hz	0.003 $\mu$ rad Peak to Peak
	Along Scan Jitter at 100 Hz	0.01 $\mu$ rad Peak to Peak
	Fuel Slosh	TBD



# Key Requirement Flowdown From MRD to S/C Bus Design Specification





# **FAME Requirements Verification - Buyoff Procedure**



- **Utilize NRL Buy-Off Procedure to Support Verification**
  - **Buyoff Is a Formal Processs for Reviewing, at Pre-Defined Phases, the Work Performed Which Demonstrates Compliance and Establishes Requirements Traceability**
    - **Performed for Each Box/Subsystem Component and at Selected System Assembly Milestones**
    - **Ensures All Related Engineering Drawings Have Been Released**
    - **Verifies H/W Built and Tested to Approved Engineering Requirements**
    - **Verifies That All Discrepancies, Anomalies, and Non-Conformances Have Been Documented and Dispositioned**
    - **Summarizes Verifications Completed to Level of Buyoff**
  - **Copy of Buyoff Package Is Maintained by QA (tbr) to Support Verification and Future Inquiries**



# Verification Plan



- **Verification Methods**
  - **Analysis**
  - **Inspection**
  - **Demonstration or Measurement**
  - **Simulation**
  - **Test**
- **Specific Tests, Analyses, and Inspections Are Presented in Subsystem, System Test Presentations**